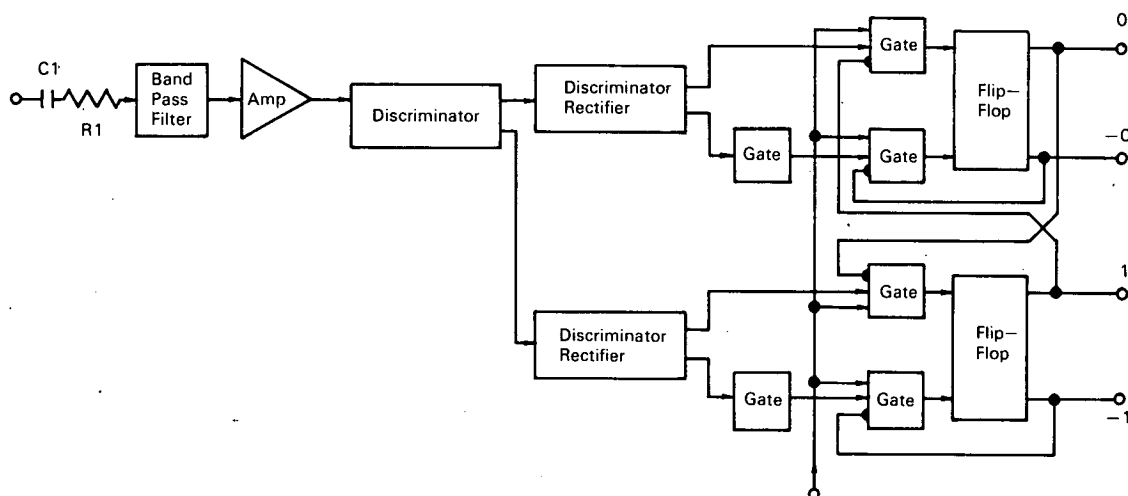


NASA TECH BRIEF



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Unique Frequency-Shift-Keyed Demodulation System



The problem:

In prior frequency-shift-keyed (FSK) demodulators, the incoming signal is fed to a discriminator and the discriminator output summed to produce the conventional "S" curve. This output is applied to the inputs of two Schmitt trigger circuits, one of which is responsive to negative pulses and the other to positive pulses. Thus, the channel for decoding binary ones must differ from that decoding binary zeros. These demodulators also lack a simple and reliable means for rejecting data applied at a frequency greater than the desired. Inaccuracy has also been a disadvantage in this type demodulator.

The solution:

An FSK demodulator in which the discriminator outputs are separate and applied to two identical decoding channels, one decoding binary ones and the other decoding binary zeros. This demodulator rejects data applied to it at any frequency higher than design.

How it's done:

The demodulator provides a frequency discriminator in combination with two decoding channels. The discriminator produces one output in response to a positive shift in frequency and applies it to a channel for decoding binary ones. It produces another output in response to a negative shift in frequency and applies it to a channel for decoding binary zeros.

These two channels are identical; each includes a discriminator rectifier, a flip-flop, and a set of gates responsive to output signals from the discriminator rectifier for selectively setting and resetting the flip-flop. The discriminator rectifier circuit includes a capacitor that must charge and discharge at a predetermined value before the set gate will be conditioned to change the state of the flip-flop. By this arrangement, the capacitor must be recharged before the discriminator rectifier can produce another output signal to condition the set gate. Thus, the channel

(continued overleaf)

rejects data received at a frequency greater than the charge-discharge time of the capacitor.

Notes:

1. This technique should be of general interest for point-to-point data transmission applications.
2. Inquiries concerning this invention may be directed to:

Technology Utilization Officer
Goddard Space Flight Center
Greenbelt, Maryland 20771
Reference: B67-10668

Patent status:

Inquiries about obtaining rights for the commercial use of this invention may be made to NASA, Code GP, Washington, D.C. 20546.

Source: S. Teitelbaum and Charles Staloff
of RCA
under contract to
Goddard Space Flight Center
(GSC-217)